GE Healthcare

ÄKTAcrossflow

Installation Guide

ÄKTA™

Important user information

All users must read this entire manual to fully understand the safe use of ÄKTAcrossflow.

WARNING!

The WARNING! sign highlights instructions that must be followed to avoid personal injury. Do not proceed until all stated conditions are clearly understood and met.

CAUTION!

The CAUTION! sign highlights instructions that must be followed to avoid damage to the product or other equipment. Do not proceed until all stated conditions are met and clearly understood.

Notes

Note: *A Note is used to indicate information that is important for trouble-free and optimal use of the product.*

Recycling

This symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of equipment.

WARNING!

This is a Class A product. In a domestic environment, it might cause radio interference, in which case the user might be required to take appropriate measures.

WARNING!

All repairs should be done by personnel authorized by GE Healthcare. Do not open any covers or replace any parts unless specifically stated in the instructions.

WARNING!

The computer should be installed and used according to the instructions provided by the manufacturer of the computer.

WARNING!

The mains power switch or other disconnect device must always be easy to access.

CE-certification

This product complies with the European directives by fulfilling corresponding standards.
A copy of the Declaration of Conformity is available on request.

The **CE** logo and corresponding declaration of conformity, is valid for the instrument when it is:

- used as a stand-alone unit, or
- connected to other CE-marked GE Healthcare instruments, or
- connected to other products recommended or described in this manual, and
- used in the same state as it was delivered from GE Healthcare except for alterations described in this manual.

Note: *The Declaration of conformity is valid only for systems that are marked with the **CE** logo:*

CE

Contents

1 About this installation guide

1.1 Installation 7
1.2 Associated documentation 7

2 Safety

3 Pre-requisites

4 Installation overview

5 Installation of ÄKTAcrossflow

5.1 Site environment 15
5.1.1 Room climate 15
5.2 Unpacking the instrument 16
5.3 Lifting the instrument 18
5.4 Moving the instrument 20
5.5 Installing 22
5.5.1 Reservoir holder 23
5.5.2 Reservoir 25
5.5.3 Bottle holders 26
5.5.4 Bag holder (optional) 27
5.6 Connecting the tubing 28
5.7 Leveling the instrument 30
5.7.1 Top cover 32
5.8 Installing the computer and the mains cable 33
5.9 Installing the Ethernet communication cable 34
5.10 CU-950 configuration 34
5.11 Connecting Frac-920 (optional) to ÄKTAcrossflow 35
5.11.1 Connecting to mains supply 35
5.11.2 UniNet-1 communication 38

6 Installation test

6.1 Preparation of ÄKTAcrossflow 41
6.1.1 Starting the system 41
6.2 The installation test 43
6.2.1 Preparing the installation test 43
6.2.2 Level sensor calibration 44
6.2.3 Run the installation test 46
6.3 Description of the Installation Test 50
6.4 Evaluating the installation test results 52
6.4.1 How to start the evaluation procedure manually 56

7 Troubleshooting the Installation Test

8 Installation record

9 Registration form

1 About this installation guide

WARNING! This instrument is intended for laboratory use only, not for clinical or *in vitro* diagnostic purposes.

ÄKTAcrossflow™ is assembled and fully tested before shipping.

For safe transportation, however, some components have been detached and therefore need to be remounted.

This guide describes how to install ÄKTAcrossflow. The guide is divided into two parts; one describing the installation and one describing how to run the installation test. After the installation procedure has been performed, your ÄKTAcrossflow is ready for filtration work.

For full details of specifications, methods, maintenance, etc., refer to the respective User Manuals and Instructions.

1.1 Installation

Important! The installation of ÄKTAcrossflow must be performed by personnel authorized by GE Healthcare.

1.2 Associated documentation

The following documentation is also included with the ÄKTAcrossflow system:

The *ÄKTAcrossflow Instrument Handbook* contains technical information, maintenance schedules and instructions for troubleshooting and user maintenance.

The *ÄKTAcrossflow User Manual* contains detailed operating instructions.

The *ÄKTAcrossflow Safety Handbook* contains safety information.

The *ÄKTAcrossflow Method Handbook* provides more detailed information on applications.

The UNICORN™ control system package includes three manuals:

- *Getting Started*
- *User Reference Manual (2 pcs)*
- *Administration and Technical Manual*

Documentation of the ÄKTAcrossflow specific Evaluation module includes:

- *User Reference Manual – UNICORN 5.1 – Evaluation for cross-flow*
- Specific sections in *Online Help*

2 Safety

- This system is designed for indoor use only.
- Do not use the system in a dusty atmosphere or close to spraying water.
- The instrument unit and the PC should be installed and prepared by personnel authorized by GE Healthcare.

WARNING! Heavy object! The instrument unit weighs 70 kg. Use suitable lifting equipment when moving the instrument. Wear safety shoes.

WARNING! The instrument must always be used with the protective earth lead of the power cord correctly grounded to earth at the mains outlet.

Refer also to *ÄKTAcrossflow Safety Handbook* for safety information.

3 Pre-requisites

WARNING! ÄKTAcrossflow must be connected to a grounded mains socket.

- For lifting instructions, see sections 5.3 and 5.4.
- To install ÄKTAcrossflow, a working area of about 120 × 60 cm is required.
- ÄKTAcrossflow requires 100 to 240 V~, 50 to 60 Hz electrical supply with safety grounding.
- A waste flask is needed.
- The installation test requires the following solutions:

  - 3 L of distilled water.

  - 1000 ml 1M NaCl with 0.4% acetone and 15 mM phosphoric acid added.

4 Installation overview

- Unpack ÄKTAcrossflow 16
- Detach packing material 16
- Lifting the instrument 18
- Moving the instrument 20
- Levelling the instrument 30
- Unpack and install computer 33
- Connect mains power cabling 33
- Connect ethernet communication cabling 34
- Unpack and install Frac-920 (optional) 35
- Complete the first two sections of the installation record 63
- Prepare ÄKTAcrossflow for the installation test 41
- Run the installation test 46
- Complete the registration form 65
- Complete the final section of the installation record 63
- Store photocopies of all records and forms in the System Logbook.

4 Installation overview

5 Installation of ÄKTAcrossflow

5.1 Site environment

5.1.1 Room climate

Bench space

The ÄKTAcrossflow instrument should be placed on a stable and level laboratory bench. Allow space for the monitor beside the instrument.

ÄKTAcrossflow instrument dimensions	620 × 400 × 650 mm (W × D × H)
Weight, instrument unit	70 kg

Environment

Operating temperature	4 to 40°C (39 to 104°F)
Relative humidity, operation	20 to 95% (non-condensing)
Air pressure	75 to 105 kPa (up to 2000 m altitude)

The instrument must not be exposed to direct sunlight. Dust in the surrounding atmosphere should be kept to a minimum.

Power requirements

Mains voltage	100 to 240 V~ ±10%, 50 to 60Hz (Auto range) (Installation category II)
Power consumption	900 VA

5.2 Unpacking the instrument

Follow the step-by-step instructions below and fill in the Installation Record as you go along, see page 63.

Note: Some items are packed in separate boxes delivered with the system.

Note: Packing lists are included in the boxes.

- After removing the cardboard hood and other packing material check the contents against the enclosed packing list. Also check all enclosed boxes. Store all the boxes and plastic bags in a convenient nearby place.

- Open the plastic cover from the top and fold down to uncover the system. Take care not to damage any tubing or components while doing this.

- Remove the plastic cover from the system.
- Save all the original packing material. If the equipment has to be re-packed, for transportation or otherwise, it is important that the system can be safely packed using the original packing material.

5.3 Lifting the instrument

WARNING! Heavy object. The ÄKTAcrossflow instrument weighs 70 kg. Use suitable lifting equipment to lift the instrument. Wear safety shoes.

WARNING! Heavy object. The ÄKTAcrossflow instrument weighs 70 kg. A minimum of two people are required to lift the instrument. Wear safety shoes.

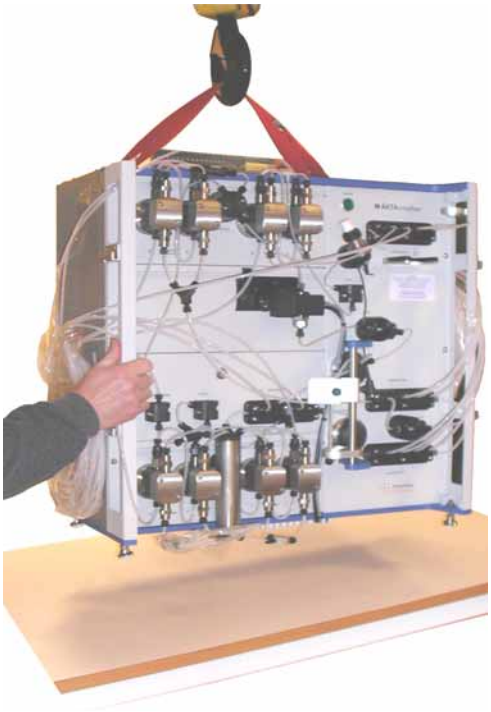
After unpacking the instrument, lifting equipment is needed to lift the instrument. If lifting equipment is not available, see instructions in section 5.4.

Note: The top cover is not mounted at delivery.

1 A lifting strap is attached to the instrument at delivery, see figure below.

WARNING! The instrument has feet with low friction. To prevent the instrument from sliding, the workbench surface must not be inclined. When moving the instrument on a trolley, the instrument must be secured.

2 Lift the instrument onto the workbench, or onto a trolley for transportation.



5.4 Moving the instrument

WARNING! The instrument has a high center of gravity. Due to the risk of tipping over, do not place the instrument close to the edge of the bench.

WARNING! The instrument has feet with low friction. To prevent the instrument from sliding, the bench surface must not be inclined.

WARNING! Heavy object. The ÄKTAcrossflow instrument weighs 70 kg. A minimum of two people are required to lift the instrument. Wear safety shoes.

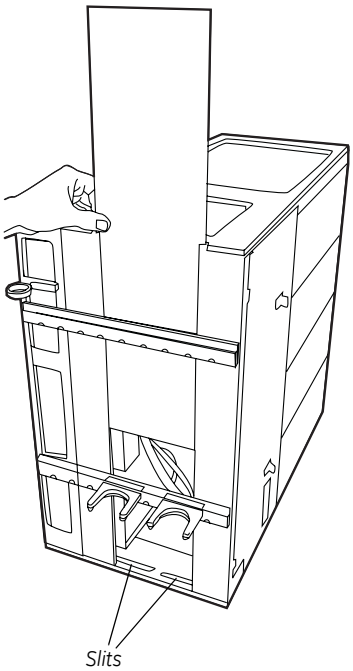
CAUTION! Bottle holders and the bag holder should not be mounted when lifting and moving the instrument.

If a smaller movement of the instrument is necessary on the laboratory bench, the instrument can be moved by carefully pushing it along the bench surface.

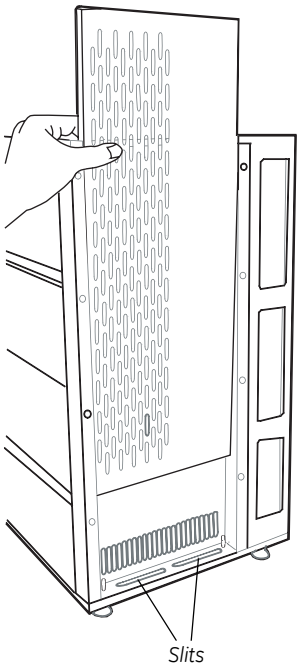
If a smaller lift of the instrument is necessary (i.e., without using lifting equipment) proceed as follows:

1 Use the slits in the bottom frame (two slits on each side, see figures below) to manually lift the instrument.

Right-hand side cover



Left-hand side cover



Note: There is no need to remove the side covers when lifting the instrument manually.

5.5 Installing

Begin by creating a clean and dry working area of 120 × 60 cm that allows easy access.

WARNING! Select a place for ÄKTAcrossflow where it is easy to access the mains power switch on the rear panel of the instrument.

WARNING! Do not block the rear panel of the system. The mains power switch must always be easy to access.

Then follow the step-by-step instructions below and fill in the installation record as you go along, see page 63.

For safe transportation the following components have been detached and thus need to be remounted:

- Reservoir holder
- Reservoir
- Bottle holders
- Bag holder (optional)

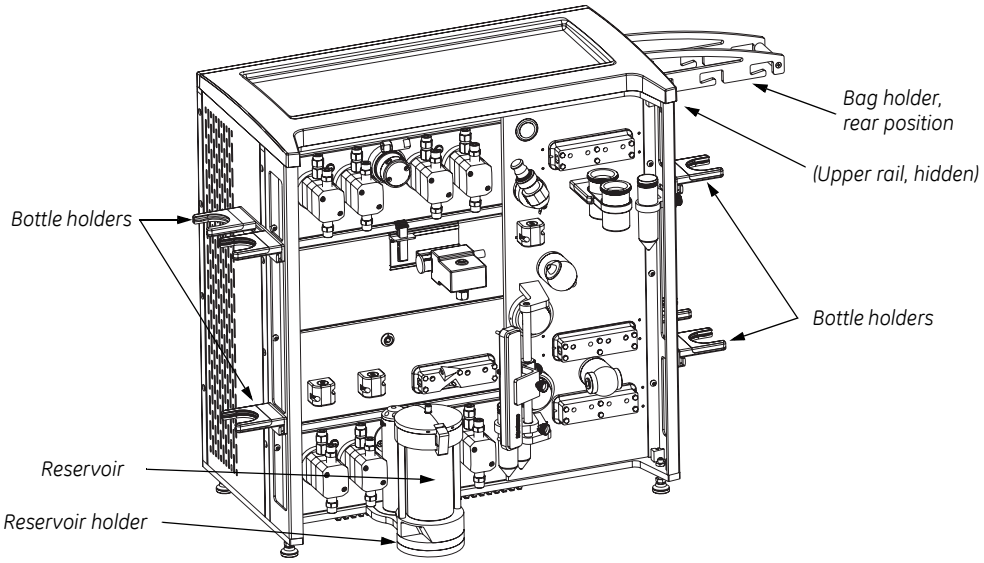
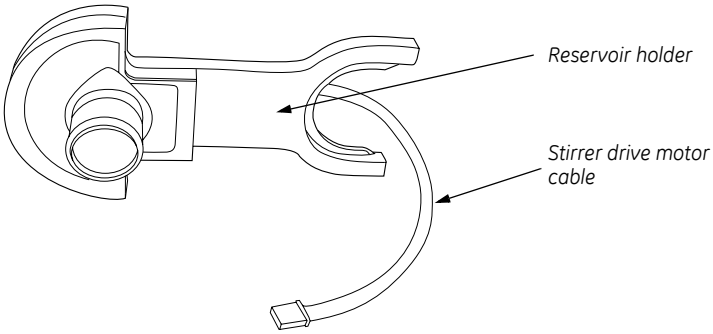


Fig 5-1. Location of components to be remounted.

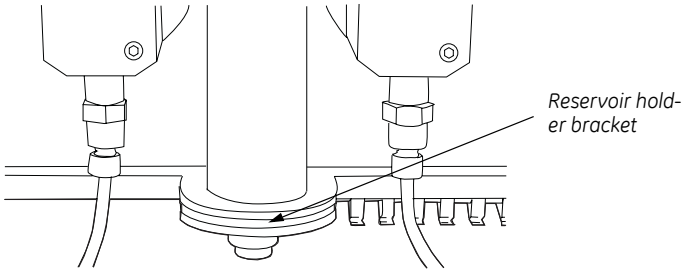
5.5.1 Reservoir holder

Install the reservoir holder as follows:

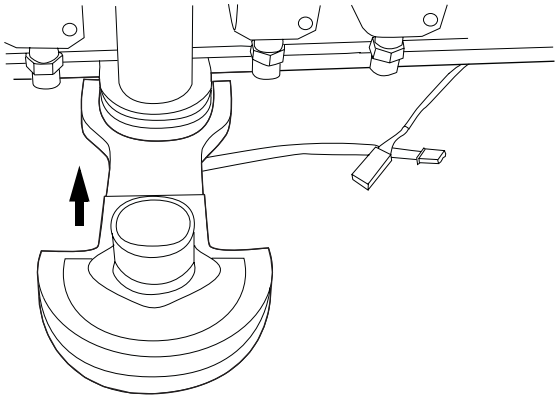
1 Unpack the reservoir holder.



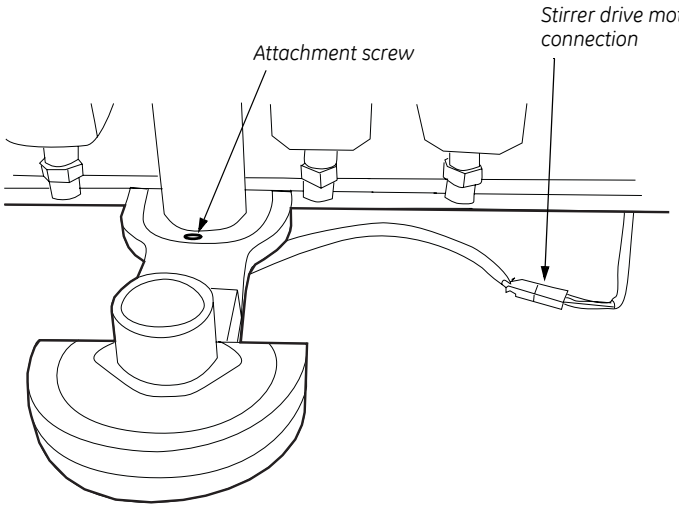
2 Locate the reservoir holder bracket on the instrument unit.



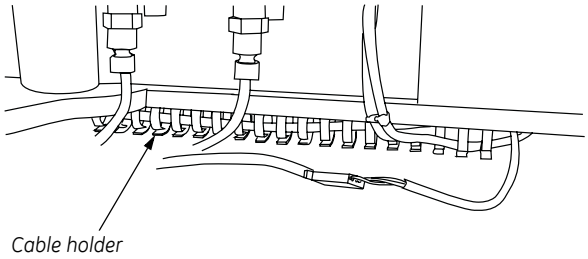
3 Attach the reservoir holder.



4 Tighten the attachment screw. Locate the instrument's stirrer drive motor cable and connect the cables.

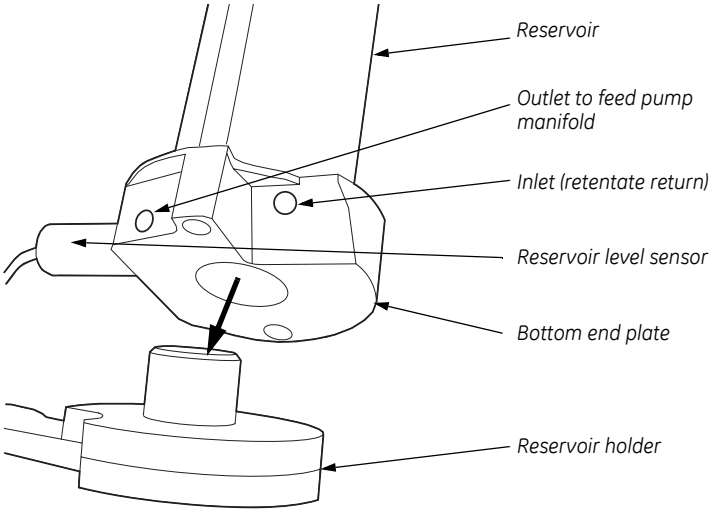


5 Insert the connected stirrer drive motor cable into the cable holder under the instrument.

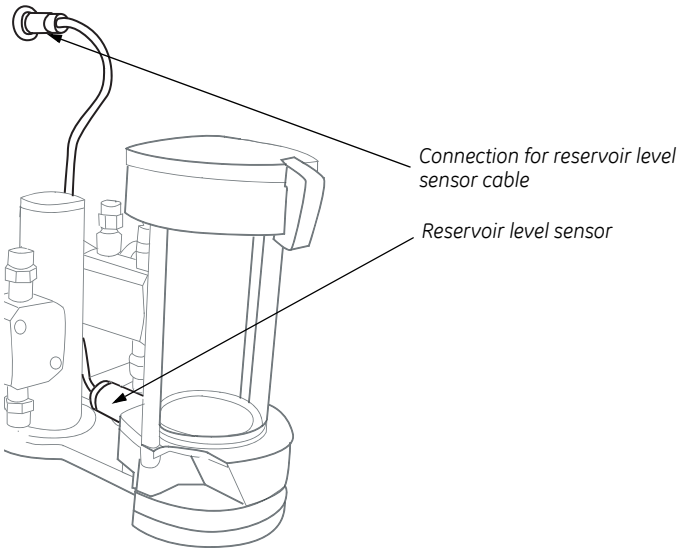


5.5.2 Reservoir

1 Place the reservoir onto the reservoir holder.

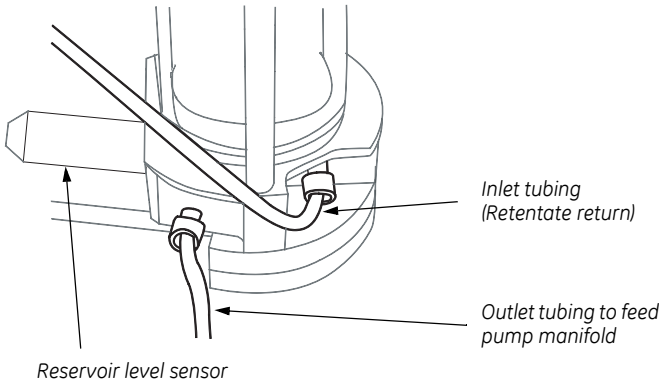


2 Connect the reservoir level sensor cable to the instrument front panel connector.



Note: When using the large reservoir (1100 ml) the reservoir level sensor cannot be installed at a right angle towards the front panel as shown in the figure above. The reservoir must be rotated to a suitable position for the level sensor.

3 Connect the inlet and outlet tubing.



5.5.3 Bottle holders

Attach the bottle holders into the rails on the instrument unit, see Fig 5-1.

The knob on the bottle holder should fit into the holes in the rail for correct position, and the locking device (spring-loaded ball) will keep the holder in place.

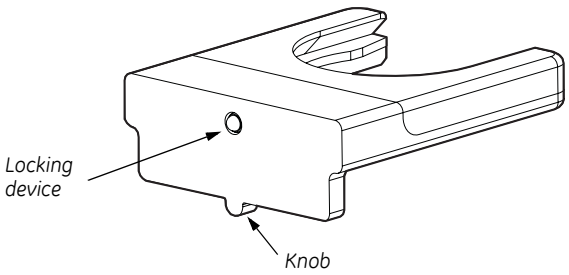


Fig 5-2. Bottle holder.

5.5.4 Bag holder (optional)

Mount the bag holder to the ÄKTAcrossflow instrument by attaching the bag holder hooks to the upper rail on the right-hand side of the instrument, see Fig 5-1.

Note: The bag holder can only be placed in two positions; the front or the rear position on the upper rail, see Fig 5-1.

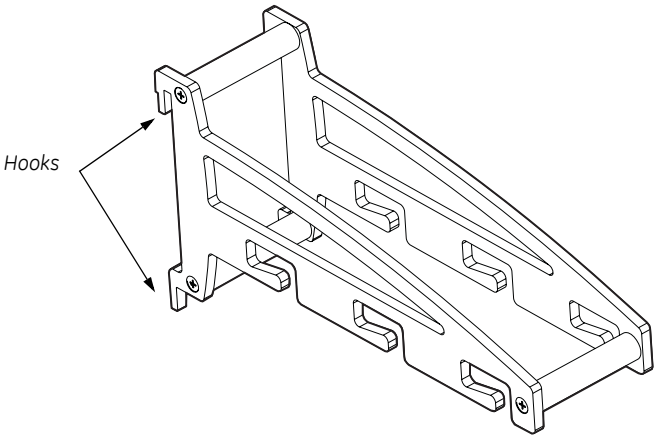


Fig 5-3. Bag holder.

5.6 Connecting the tubing

The tubing connections on the instrument are not complete on delivery. All necessary tubing is however included in the delivery and has to be connected before operating the equipment. There are a large number of tubes and connection points. Refer to section 5.1.7 “System flow path” in the Instrument Handbook for detailed information.The factory tubing connections are shown in Fig 5-4.

.

Fig 5-4. Tubes connected on delivery

Several of the tube connections are plugged when the instrument is delivered. Tubes that may have to be connected are those from the transfer valve blocks, the permeate valve block, the air sensor, the retentate valve block and the reservoir.

The tubing to and from the feed pumps may also have to be reconnected depending on the application. Generally, connections are made according to the application. Refer to the instrument handbook, section 2.2.2 “Configuration of tubing kits for high and low flow applications”.

All the tubes are tagged to show where they should be connected. The parts to which tubes are connected are shown in Fig 5-5.

.

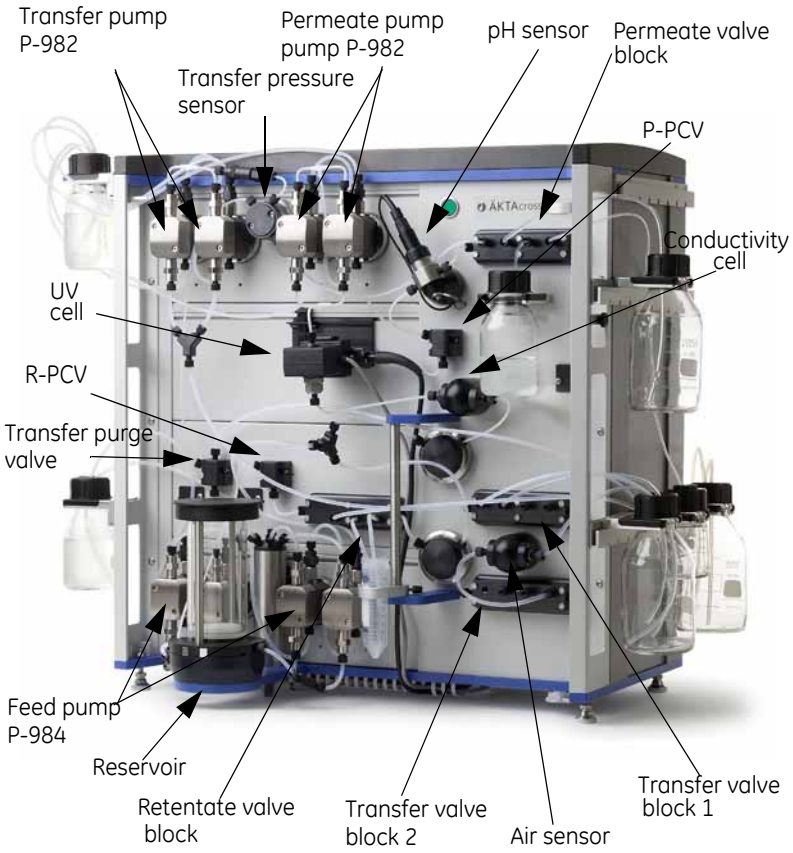


Fig 5-5. Connected and ready for operation

Be sure to tighten the connectors properly to ensure that no air is sucked into the system and that no liquid leaks out.

5.7 Leveling the instrument

After placing the ÄKTAcrossflow instrument on the laboratory bench, the instrument must be leveled.

The instrument base frame is equipped with four feet. One foot is fixed (the rear right-hand side) and the other three are adjustable, see figure below.

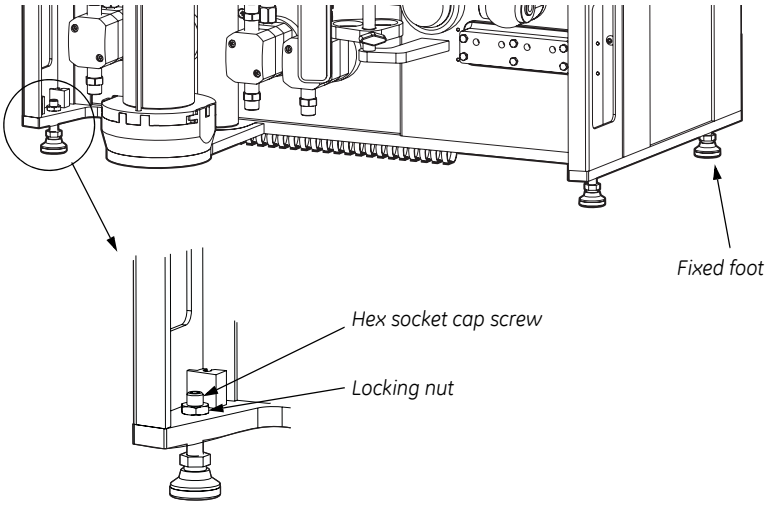
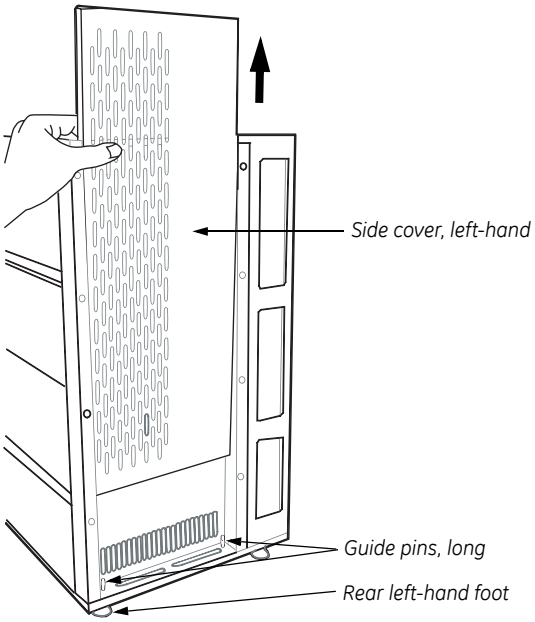


Fig 5-6. Leveling the instrument.

The two feet in the front have accessible positions for adjustment, see Fig 5-6.

However, to adjust the rear left-hand foot, the side cover must be removed, see figure below.



Tip! When remounting the left-hand side cover, first attach the side cover on the lower long guide pins, and then attach to the upper short guide pins, see figure above.

To level the instrument (see Fig 5-6):

1 Loosen the locking nuts.

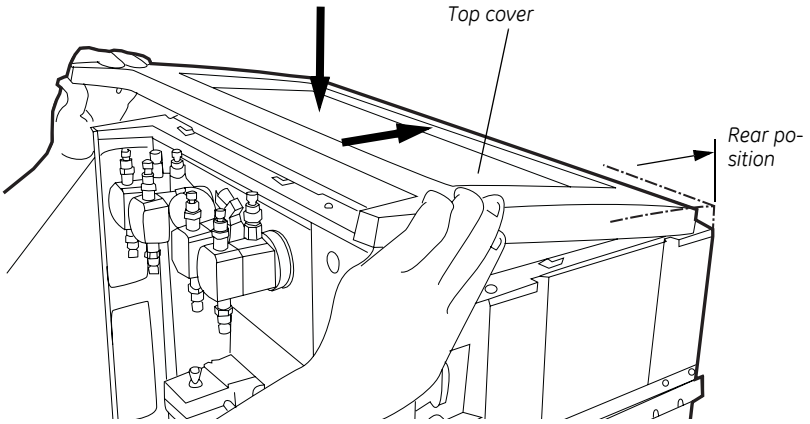
2 Using a 4 mm Allen key, adjust the height with the hex socket cap screws.

3 Check the leveling by using a spirit level on the upper plane.

4 Tighten the locking nut.

5.7.1 Top cover

Attach the top cover by first laying it down, and then sliding it backwards to the rear position, see figure below.



5.8 Installing the computer and the mains cable

CAUTION! The computer should be installed and used according to the instructions provided by the manufacturer of the computer.

Unpack and set up the computer according to the manufacturer's instructions. Do not switch on!

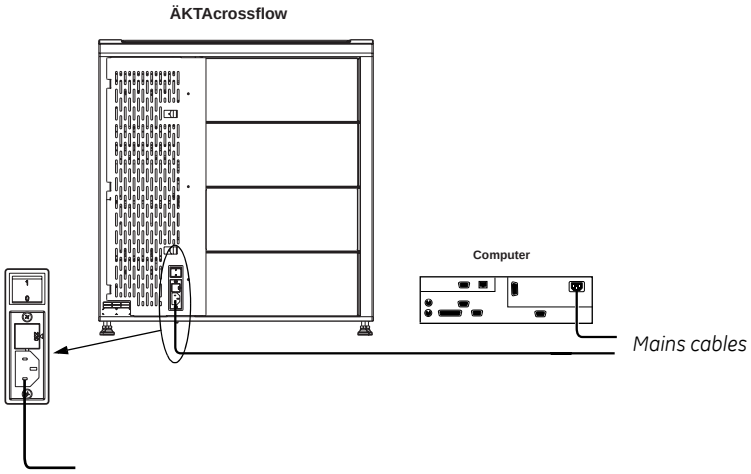


Fig 5-7. Mains cables.

Connect one end of the supplied mains cable to the ÄKTAcrossflow mains inlet, and the other end to a mains supply outlet with protective ground.

Connect one end of the supplied mains cable to the PC mains inlet, and the other end to a mains supply outlet with protective ground.

5.9 Installing the Ethernet communication cable

CAUTION! The mains power to ÄKTAcrossflow and the PC must be switched OFF before the Ethernet cabling is installed.

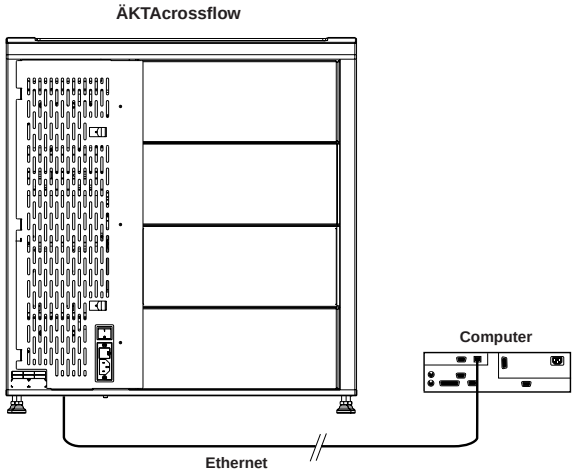


Fig 5-8. Ethernet communication cable.

One end of the Ethernet communication cable is connected to ÄKTAcrossflow at delivery. Connect the other end to an Ethernet communication port.

5.10 CU-950 configuration

For instructions on configuration of the CU-950, refer to *ÄKTAcrossflow Service Manual*.

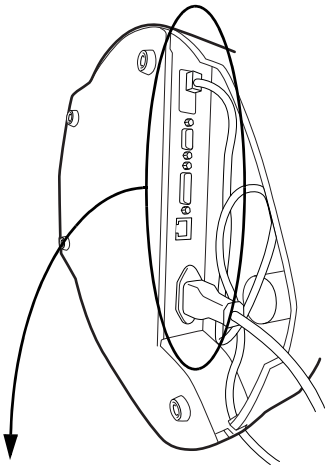
The mechanical and electrical installation phase of ÄKTAcrossflow is now complete.

5.11 Connecting Frac-920 (optional) to ÄKTAcrossflow

5.11.1 Connecting to mains supply

To locate the **Mains** connector on Frac-920, see Fig 5-9 below.

Note! Frac-920 is tilted to allow access to the rear panel.



Frac-920 Rear panel

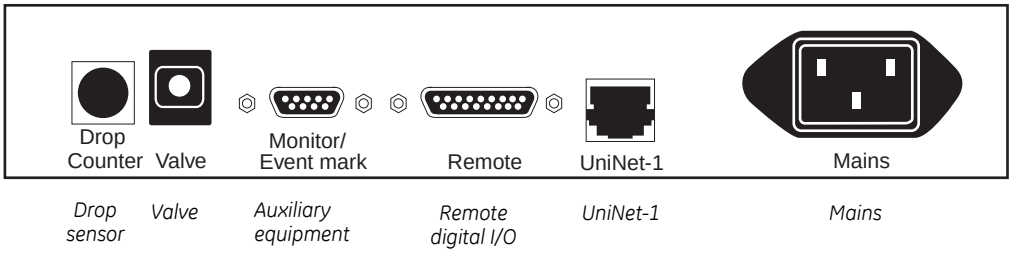
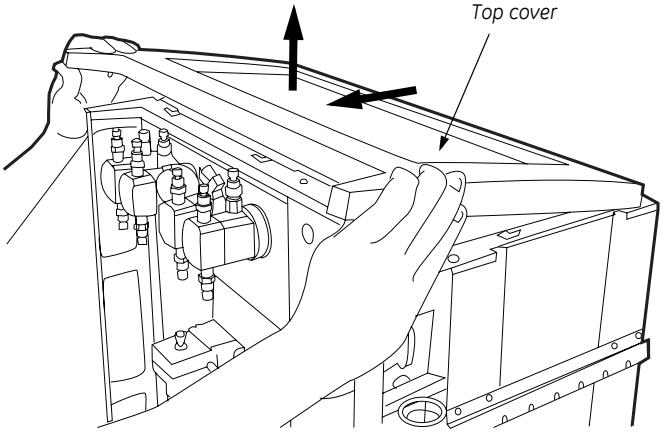


Fig 5-9. Frac-920, connectors.

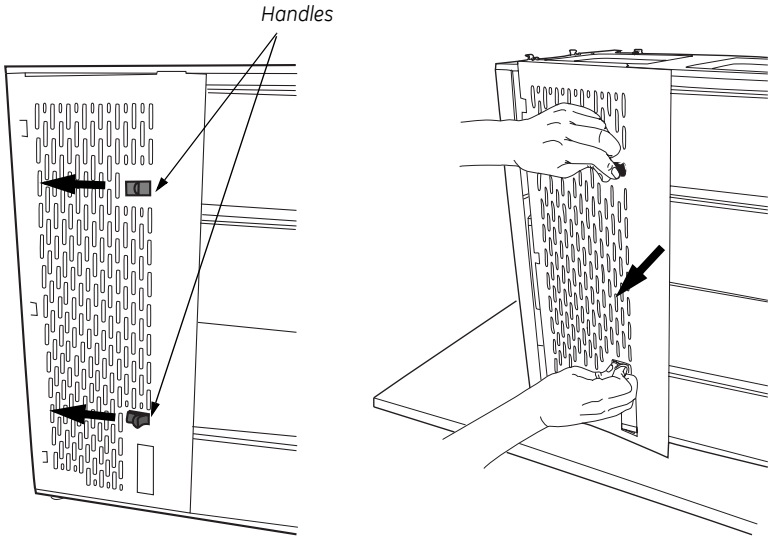
Note: Frac-920 contains no user replaceable fuse.

To connect Frac-920 to ÄKTAcrossflow, do as follows:

1 Remove the instrument's top cover by first sliding it towards the front panel and then lift up.

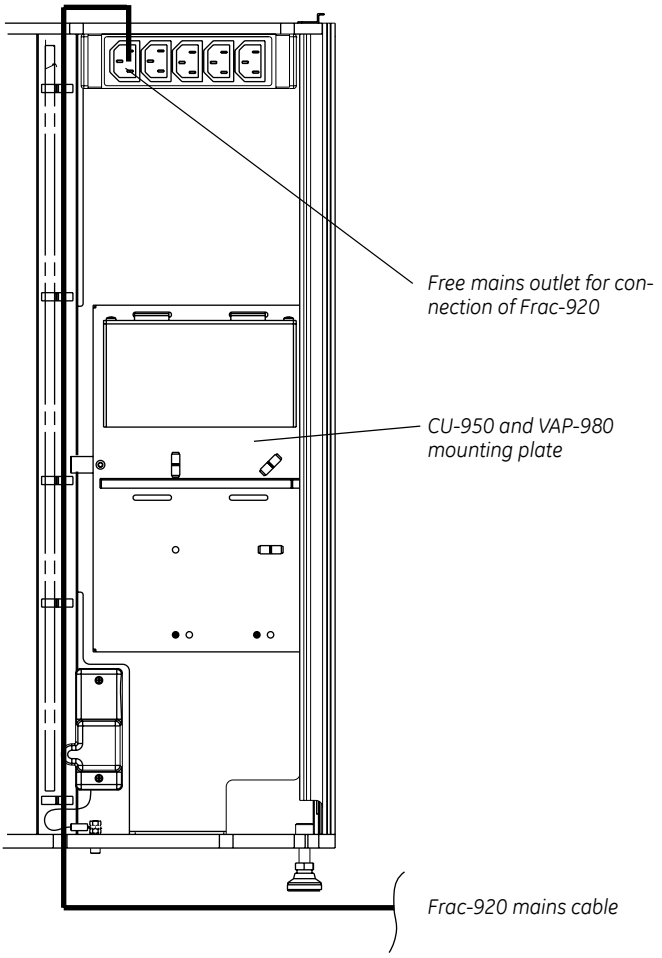


2 Using the two handles, remove the rear panel by first moving the handles sidewards to the left, and then lift out the panel.



CAUTION! The free mains outlet inside the ÄKTAcrossflow instrument is intended for connection of the fraction collector Frac-920 only.

3 Connect the supplied mains cable between Frac-920 and the free mains socket inside the ÄKTAcrossflow instrument.



Note: The illustration above shows the mains outlet from inside the ÄKTAcrossflow instrument with the rear panel removed.

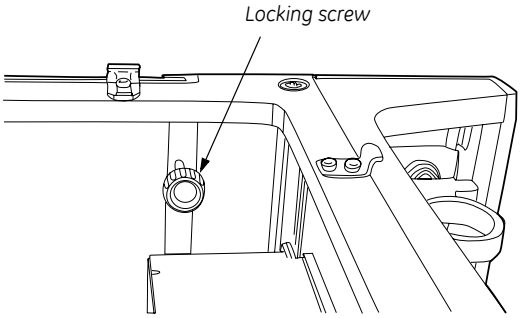
Note: For easy access inside the instrument, the CU-950 and VAP-980 mounting plate is suspended pivotally.

5.11.2 UniNet-1 communication

CAUTION! The mains power to the ÄKTAcrossflow system and the PC must be switched off before connecting the instrument to the UniNet-1 link.

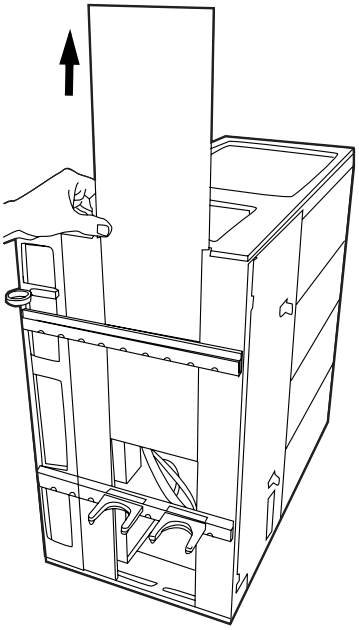
To include the fraction collector in the UniNet-1 communication chain, do as follows:

1 Remove the right-hand side cover by first loosening the locking screw inside the instrument one turn.

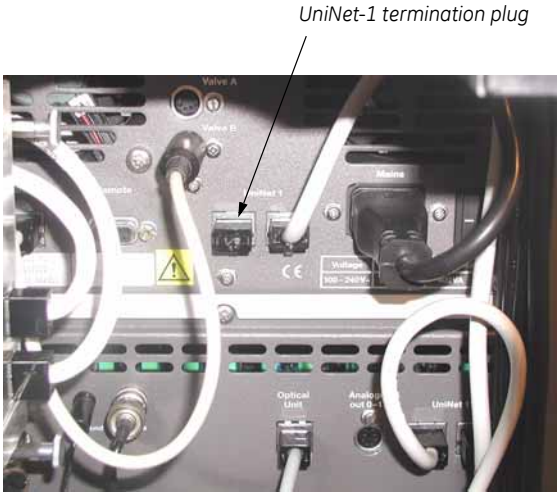


Note: The locking screw is intended primarily for EMC grounding.

2 Lift up and remove the side cover.



3 Locate and remove the UnitNet-1 termination plug, and connect one end of the UniNet-1 cable (included with the fraction collector) instead.



Tip! Save the termination plug in, for example, the accessory box.

4 Connect the other end of the UniNet-1 cable to Frac-920, see Fig 5-9 and Fig 5-10.

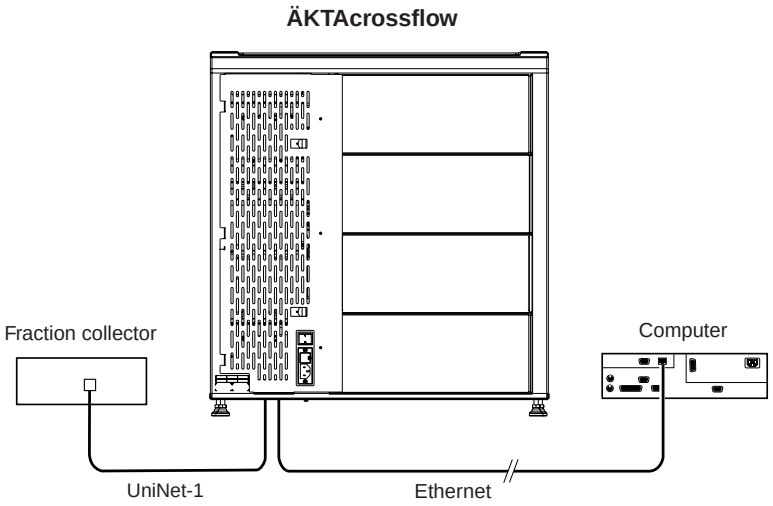


Fig 5-10. Communication cabling including a fraction collector.

6 Installation test

The installation test is designed to check the function of all pumps and valves, and the monitoring system of ÄKTAcrossflow. The installation test can be used at any time to check the condition of the system.

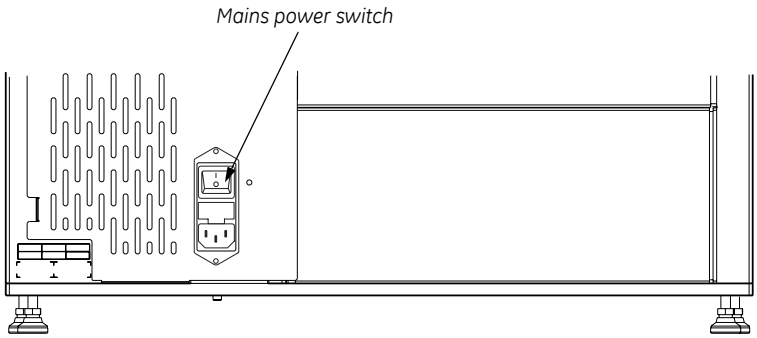
IMPORTANT! The level sensor must always be calibrated before performing the installation test.

6.1 Preparation of ÄKTAcrossflow

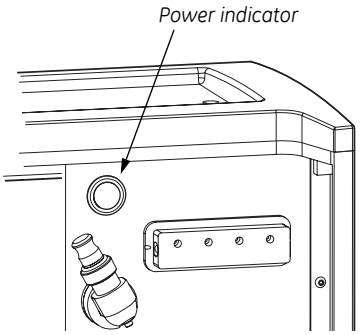
6.1.1 Starting the system

To start the ÄKTAcrossflow system:

1 Switch on the instrument at the mains power switch located on the rear panel.



- The **Power** indicator on the front panel flashes slowly until the internal communication with the CU (Control Unit) is established.



- The **Power** indicator displays a constant green light when the internal

communication with the CU is established.

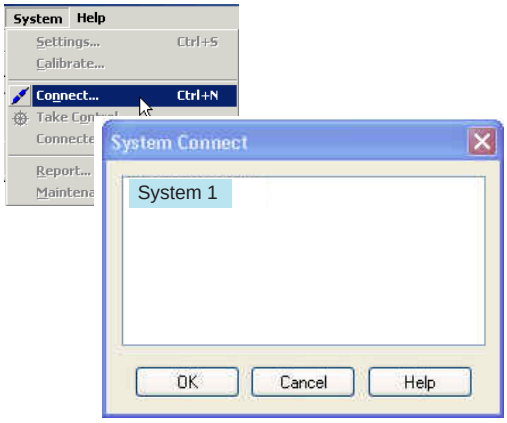
2 Switch on power to the PC and the monitor.

3 Start and log on to UNICORN by double-clicking on the icon on the Microsoft™ Windows™ desktop.

4 Enter ***Username*** and ***Password*** and click ***OK***.

*Note: When log on for the first time, enter **default** as user name and password. For instructions on how to change user name and password, refer to ÄKTAcrossflow User Manual.*

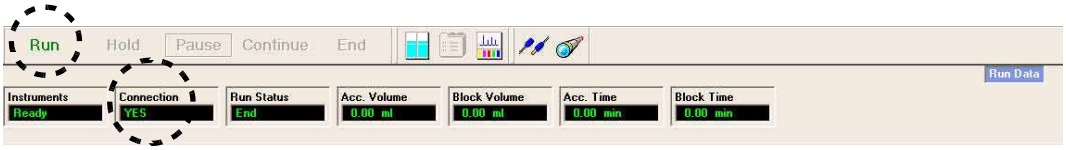
5 In the ***System Control*** module, select ***System:Connect...*** to connect UNICORN to the instrument unit.



6 Select the appropriate system name and click ***OK***.

When the communication between UNICORN and the instrument unit is established:

- There is a constant green light on the **Power** indicator on the front panel.
- The green ***Run*** indicator in the status bar in UNICORN is lit.
- The ***Connection*** box shows ***Yes***.



6.2 The installation test

6.2.1 Preparing the installation test

Prior to running the installation test, follow the instructions below:

1 Place all inlet and outlet tubing, not including R-VB-Out1, R-VB-Out2 and P-VB-Out1, into a bottle containing 3 liters of distilled water.

2 Place outlet tubing from the transfer purge valve, R-VB-Out1, R-VB-Out2 and P-VB-Out1 into a 3 L waste bottle.

Sample solution

Prepare the following sample solution for test of UV, pH and Cond:

Sample solution 1000 ml containing:	
NaCl, 1.00 M	58.44 g
Acetone, 0.4%	4 ml
Phosphoric acid, 15 mM	1.0 ml H_3PO_4

Note: Keep the sample solution in a bottle with tight lid to avoid acetone evaporation.

Target values for monitors:	
UV	Minimum amplitude change allowed is 85.0 mAU
pH	Minimum amplitude change allowed is 2.0

Target values for monitors:	
Cond	Minimum amplitude change allowed is 70.0 mS/cm

6.2.2 Level sensor calibration

The level sensor must always be calibrated before starting the installation test.

1 In the ***System Control*** of UNICORN select ***File:Instant Run.***

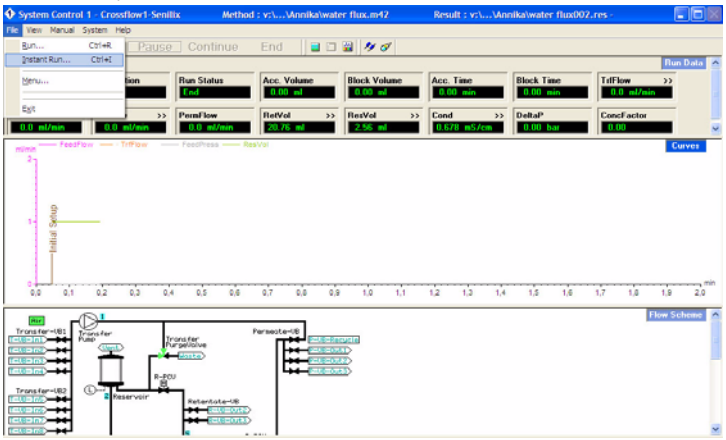


Fig 6-1. ***Instant run*** drop down menu

2 The window below appears. Select a system in the ***For system*** drop down menu. In the ***Use*** frame choose the ***Wizard*** button and click ***Run.***

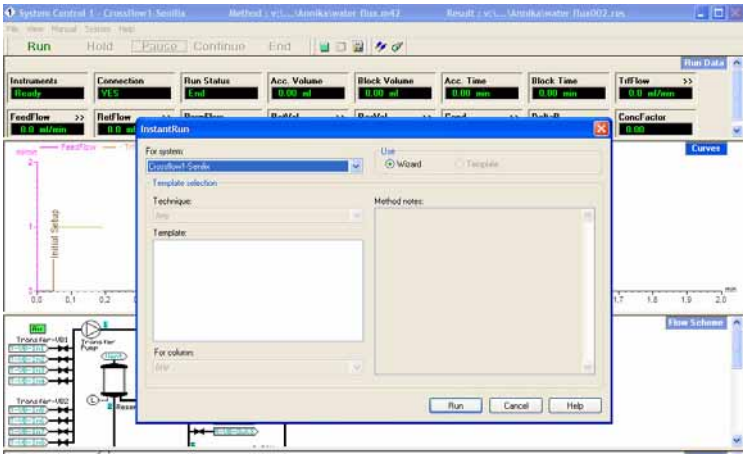


Fig 6-2. Use Wizard button

3 In the Method Wizard dialog, select ***Calibrate level Sensor*** as method. Click ***Run.***

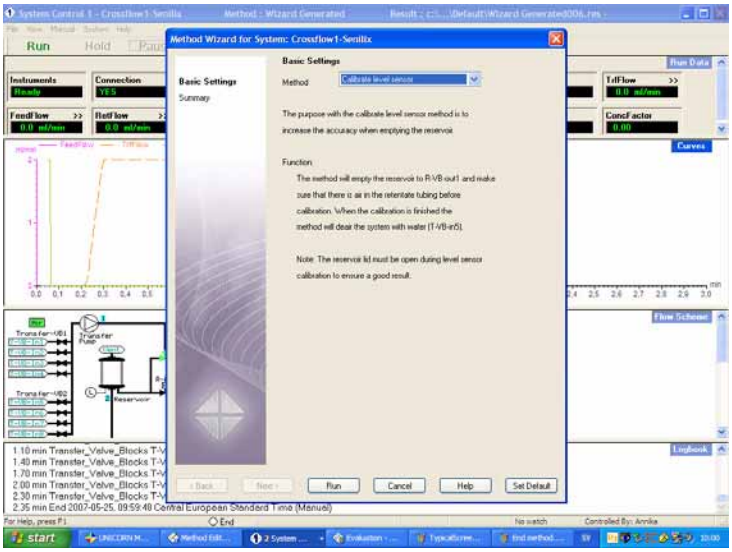


Fig 6-3. Method, Calibrate level sensor.

The level sensor will now be calibrated. The method takes about five minutes.

6.2.3 Run the installation test

IMPORTANT!

The level sensor must always be calibrated before running the installation test. See 6.2.2.

The reservoir must be empty before starting the installation test.

Make sure all finger tight connectors are tightened.

Note: Open the reservoir lid when performing the Installation Test! The Installation Test will prompt you to do this.You will also be instructed on how and where to place the waste lines.

1 In order to get a reasonable view of the Installation Test in the system control adjust the visible curves to a minimum and open ***View:Properties*** in the toolbar.

2 Deselect all curves and mark ***FeedFlow***, ***TransferFlow***, ***FeedPress*** and ***ResVol***.

3 Go to Y-axis and set the selected curves to Auto scale.

4 In the ***System Control*** of UNICORN select ***File:Instant Run.***

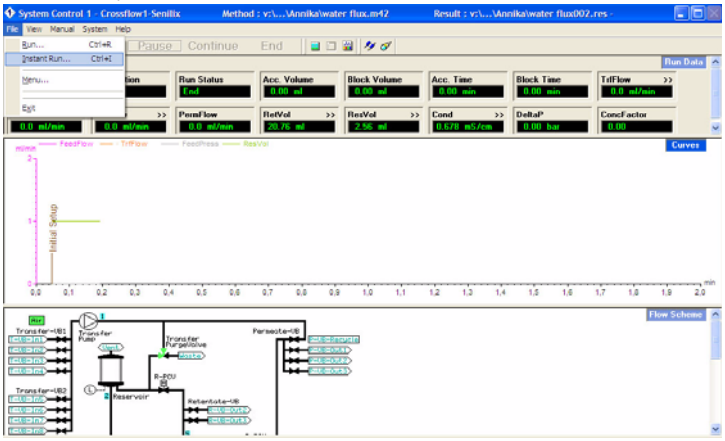


Fig 6-4. Drop down menu

5 The window below appears. Select a system in the ***For system*** drop down menu. In the ***Use*** frame choose the ***Wizard*** button and click ***Run.***

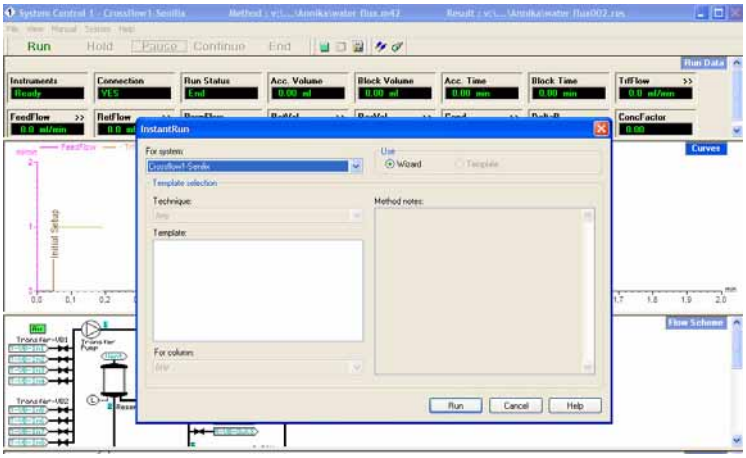


Fig 6-5. Selecting the Wizard.

Read the wizard instructions carefully and follow them exactly.

6 In the Method Wizard dialog, select ***Installation Test*** as method. Click ***Run.***

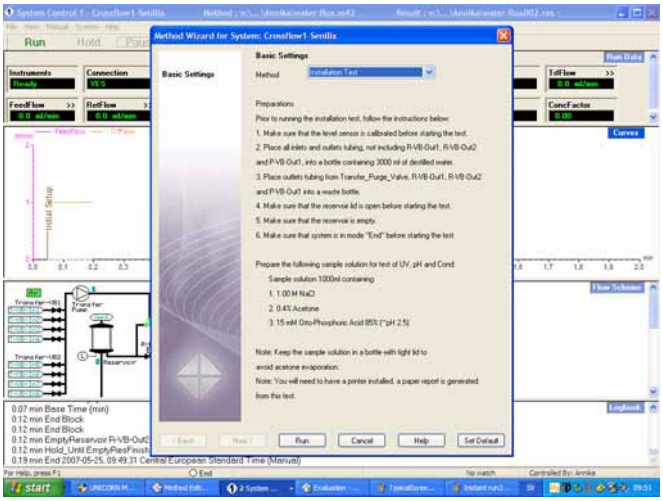


Fig 6-6. Selecting method.

7 In the ***Notes*** window, notes on the test can be entered. Click ***Next***.

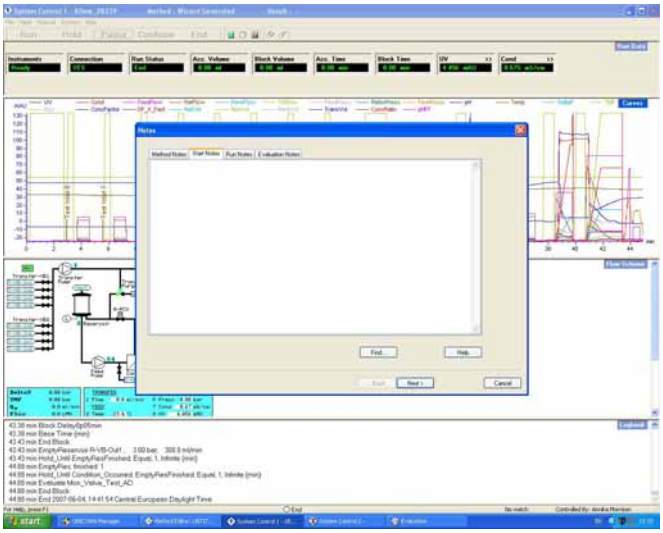


Fig 6-7. Note pad for information on the test.

8 ***Method information*** is displayed.

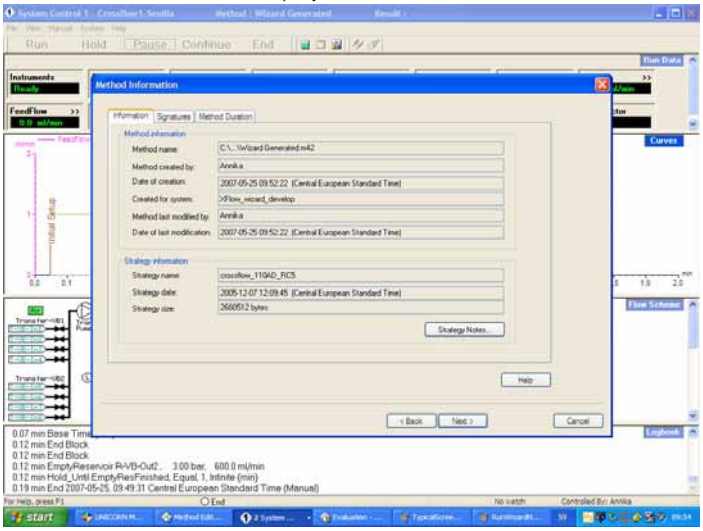


Fig 6-8. Information on Method selected.

9 In the final ***Result Name*** dialog, a result name can be entered and the file storage location can be edited.

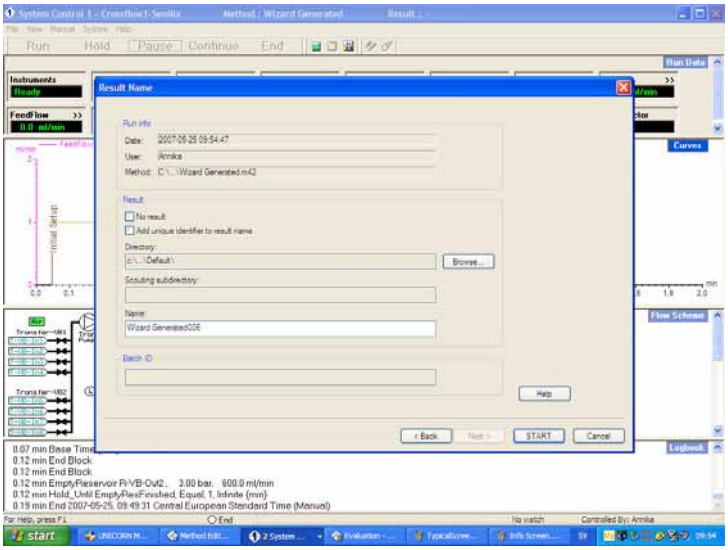


Fig 6-9. Result name dialog.

To start the Installation test, click ***START.***

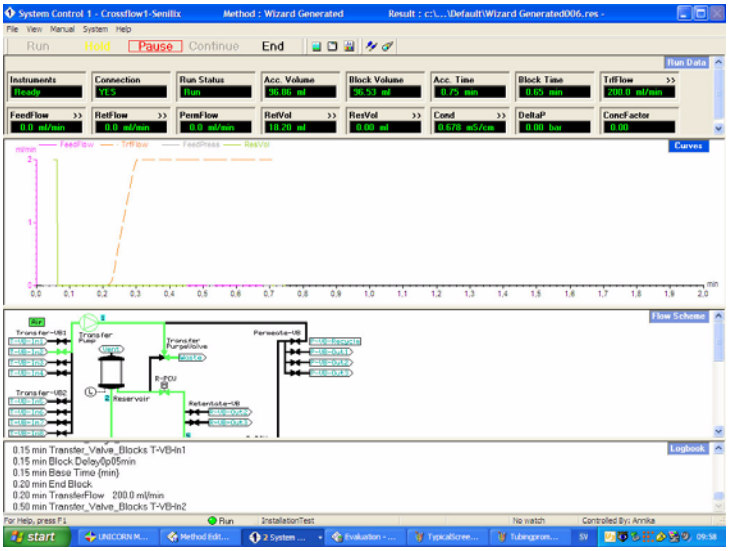


Fig 6-10. Screen when test has started.

A description of the test is found in section 6.3. During the test the system will be paused three times with a message indicating that the T-VB-In1 tubing is to be moved as described below:

1 After 25 minutes when the first part of the test is finished. Take the T-VB-In1 tubing out of the water bottle and leave it in the air.

2 After another 10 minutes. Put the T-VB-In1 tubing in the test solution.

3 After another 5 minutes. Put the T-VB-In1 tubing back in to the water bottle.

6.3 Description of the Installation Test

First part of the test:

- Primes all transfer valve inlets with water.
- Checks for blockage or leakage in all eight transfer valve inlets by pumping a specified amount of water to the reservoir.
- During this time it also checks the transfer purge valve and the level sensor functionality. The system will pause and give a message to end the run if the transfer purge valve is stuck in one position.
- The first part of the test takes 25 minutes.

Second part of the test:

- Fills the reservoir with water.
- Checks that the retentate outlet valves give the right pressure by emptying the reservoir through these outlets
- Tests the UV, conductivity and pH sensors by pumping the test solution through the permeate line. This will indicate that the sensors are working but will not show if they are calibrated correctly.
- Checks at the same time that the Air sensor is responding by pumping air through transfer valve inlet 1.
- Checks that the R-PCV and P-PCV are working and that there is feed, retentate and permeate, pressure and flow.
- Finally it washes out the test solution with water.
- The second part of the test will take 20 minutes.

Once these tests have been completed the system is filled with water and is ready for use.

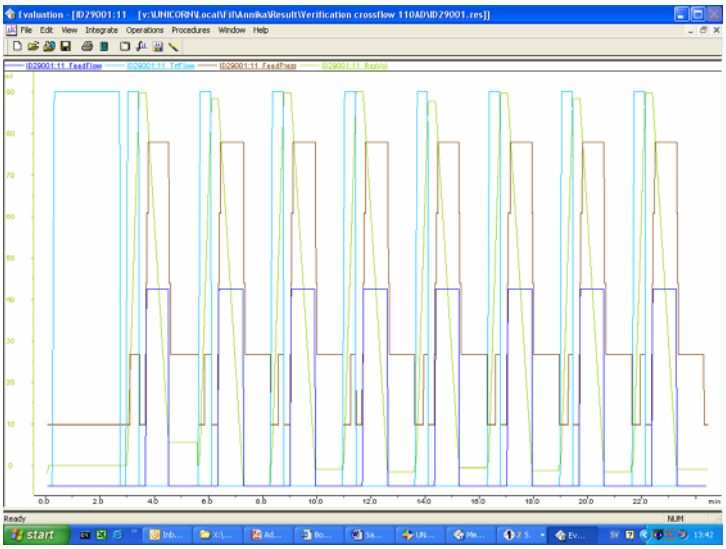


Fig 6-11. Displays the result of the first part of the installation test.

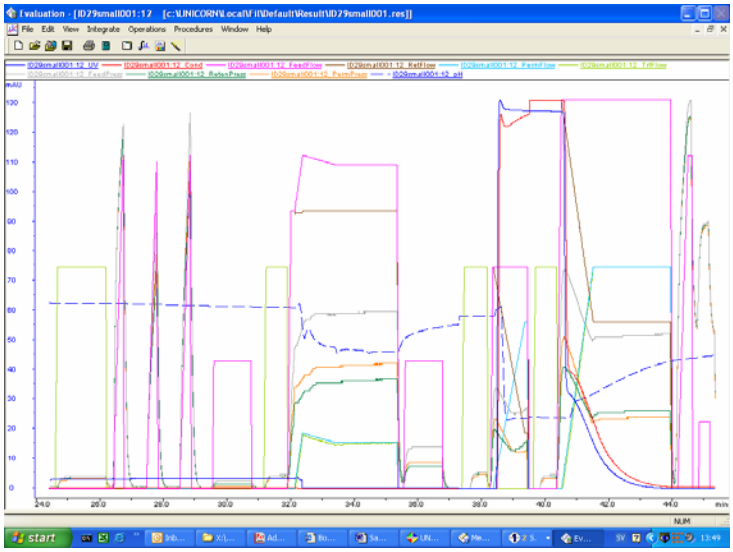


Fig 6-12. Displays the result of the second part of the installation test.

6.4 Evaluating the installation test results

The system automatically prints the test result when the test is finished. The print-out includes information about the test and indicates whether the test results are satisfactory or not.

Below is a typical example of a test result:

```
TEST INFORMATION
-------------------------------------------------------
Installation test result
System name: Xflow_28239
UNICORN version: UNICORN 5.11 (Build 407)
Time: 2007-06-04 13:00:38 (Central European Daylight
Time)
User: John Smith
Result file: v:\UNICORN\Local\Fil\John Smith\Result
\Installation test RC5 0
-------------------------------------------------------

LOGBOOK EVENT TEST RESULT
-----------------------------------------------
Level sensor functionality, OK
-------------------------------------------------------

LOGBOOK EVENT TEST RESULT
-----------------------------------------------
Transfer purge valve: OK
-------------------------------------------------------

LOGBOOK EVENT TEST RESULT
-----------------------------------------------
T-VB-In8: OK
-------------------------------------------------------

LOGBOOK EVENT TEST RESULT
-----------------------------------------------
T-VB-In7: OK
-------------------------------------------------------

LOGBOOK EVENT TEST RESULT
-----------------------------------------------
T-VB-In6: OK
-------------------------------------------------------

LOGBOOK EVENT TEST RESULT
-----------------------------------------------
```

```
T-VB-In5: OK
-----------------------------------------------------

LOGBOOK EVENT TEST RESULT
-----------------------------------------------
T-VB-In4: OK
-----------------------------------------------------

LOGBOOK EVENT TEST RESULT
-----------------------------------------------
T-VB-In3: OK
-----------------------------------------------------

LOGBOOK EVENT TEST RESULT
-----------------------------------------------
T-VB-In2: OK
-----------------------------------------------------

LOGBOOK EVENT TEST RESULT
-----------------------------------------------
T-VB-In1: OK
-----------------------------------------------------

TEST INFORMATION
-----------------------------------------------
Installation test result
System name: Xflow_28239
UNICORN version: UNICORN 5.11 (Build 407)
Time: 2007-06-04 14:41:48 (Central European Daylight
Time)
User: John Smith
Result file: v:\UNICORN\Local\Fil\John Smith\Result
\Installation test RC5 0
-----------------------------------------------------

CURVE AMPLITUDE CHANGE TEST RESULT
-----------------------------------------------
R-VB-Out1: OK
The change in amplitude was 1.82000 bar
Minimum amplitude change allowed is 1.00000 bar
-----------------------------------------------
CURVE AMPLITUDE CHANGE TEST RESULT
-----------------------------------------------
R-VB-Out2: OK
The change in amplitude was 1.41000 bar
```

```
Minimum amplitude change allowed is 1.00000 bar
-------------------------------------------------------

CURVE AMPLITUDE CHANGE TEST RESULT
-----------------------------------------------
R-VB-Out3: OK
The change in amplitude was 1.89000 bar
Minimum amplitude change allowed is 1.00000 bar
-------------------------------------------------------

CURVE AMPLITUDE CHANGE TEST RESULT
-----------------------------------------------
UV sensor: OK
The change in amplitude was 111.74500 mAU
Minimum amplitude change allowed is 85.00000 mAU
-------------------------------------------------------

CURVE AMPLITUDE CHANGE TEST RESULT
-----------------------------------------------
Cond sensor: OK
The change in amplitude was 101.54900 mS/cm
Minimum amplitude change allowed is 70.00000 mS/cm
-------------------------------------------------------

CURVE AMPLITUDE CHANGE TEST RESULT
-----------------------------------------------
pH sensor: OK
The change in amplitude was 3.91000
Minimum amplitude change allowed is 2.00000
-------------------------------------------------------

Logbook Event test result
-----------------------------------------------
Air sensor OK
-------------------------------------------------------

CURVE AMPLITUDE CHANGE TEST RESULT
-----------------------------------------------
R-PCV/P-PCV, OK
The change in amplitude was 0.66000 bar
Minimum amplitude change allowed is 0.17000 bar
-------------------------------------------------------

CURVE AMPLITUDE CHANGE TEST RESULT
-----------------------------------------------
Feed pressure sensor,   OK
```

```
The change in amplitude was 1.89000 bar
Minimum amplitude change allowed is 0.20000 bar
-----------------------------------------------------

CURVE AMPLITUDE CHANGE TEST RESULT
-------------------------------------------
Retentate pressure sensor,   OK
The change in amplitude was 1.59000 bar
Minimum amplitude change allowed is 0.20000 bar
-----------------------------------------------------

CURVE AMPLITUDE CHANGE TEST RESULT
-------------------------------------------
Permeate pressure sensor,   OK
The change in amplitude was 1.68000 bar
Minimum amplitude change allowed is 0.20000 bar
-----------------------------------------------------

CURVE AMPLITUDE CHANGE TEST RESULT
-------------------------------------------
Feed flow detected,   OK
The change in amplitude was 350.00000 ml/min
Minimum amplitude change allowed is 1.00000 ml/min
-----------------------------------------------------

CURVE AMPLITUDE CHANGE TEST RESULT
-------------------------------------------
Permeate flow detected,   OK
The change in amplitude was 200.00000 ml/min
Minimum amplitude change allowed is 1.00000 ml/min
-----------------------------------------------------

CURVE AMPLITUDE CHANGE TEST RESULT
-------------------------------------------
Transfer flow detected,   OK
The change in amplitude was 200.00000 ml/min
Minimum amplitude change allowed is 1.00000 ml/min
-----------------------------------------------------
```

Note: If the system is equipped with an old type of retentate valve block, the test result of R-VB-Out1-3 will be "Failed".

The installation test is now complete and the unit can be used in normal operation.

If any parts of the test should fail refer to the troubleshooting table in this document or consult the instrument handbook for more detailed troubleshooting guidelines.

A failure may sometimes be caused by something as basic as a leaking connection that has not been tightened properly. Always check the basics before heading into advanced fault analysis.

6.4.1 How to start the evaluation procedure manually

If for some reason no printout was generated even though the evaluation was performed correctly then proceed as follows.

- Open the result file in the UNICORN Evaluation window and click on the first chromatogram to make it active.

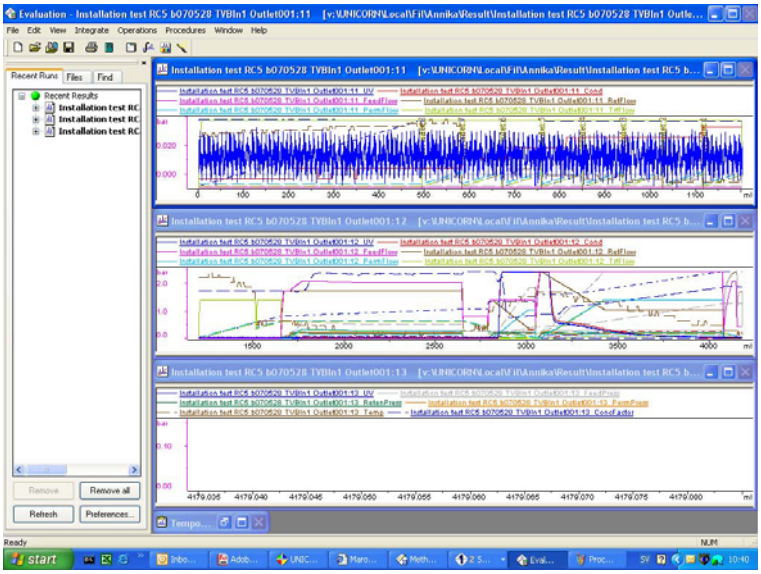


Fig 6-13. Evaluation.

- Select ***Procedures: Edit: New***.

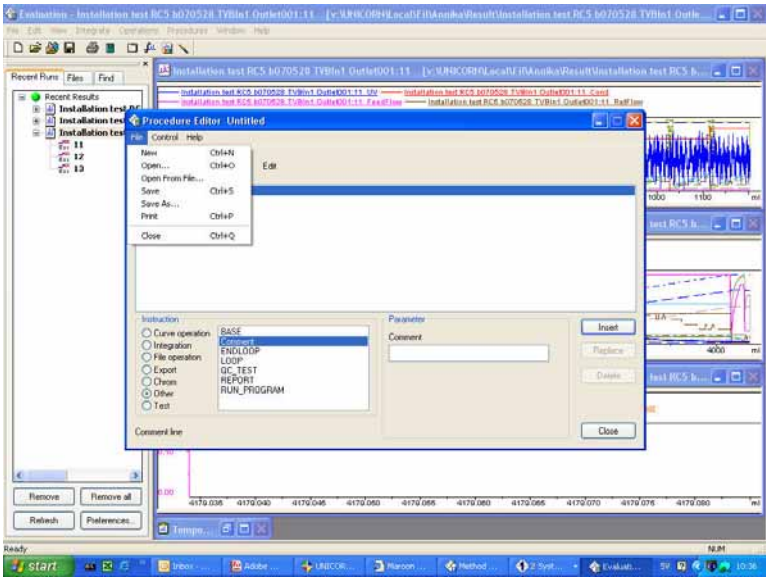


Fig 6-14. Select new procedure.

In the Procedure Edit window Select ***File: Open from file: Trf_ValveBlockTest_AD.***

.

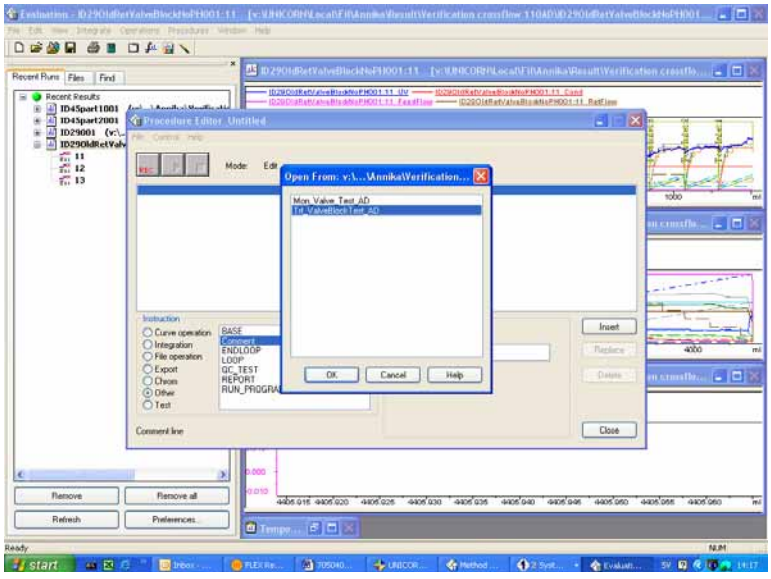


Fig 6-15. Procedure editor.

- Select ***Control: Run*** and the first part of the report will be printed.

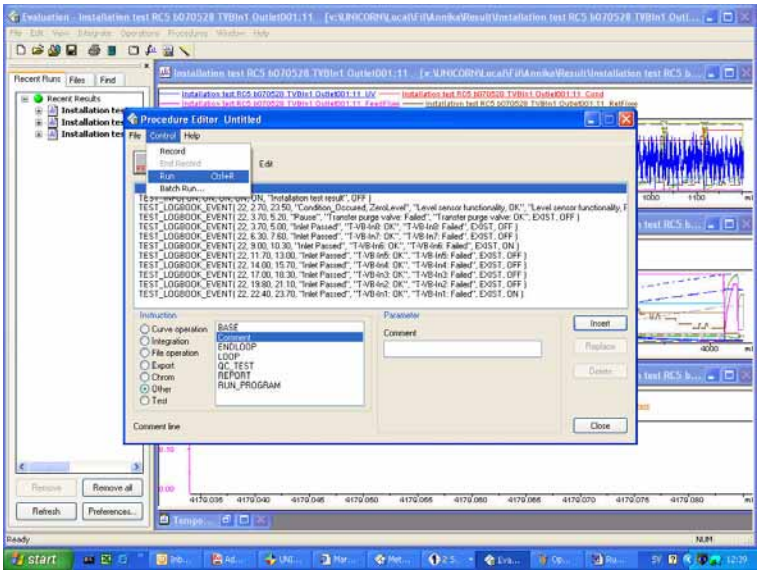


Fig 6-16. Run procedure.

At this point, close the Procedure Edit window to return to the evaluation diagrams. Click on the second chromatogram to make this window active.

.

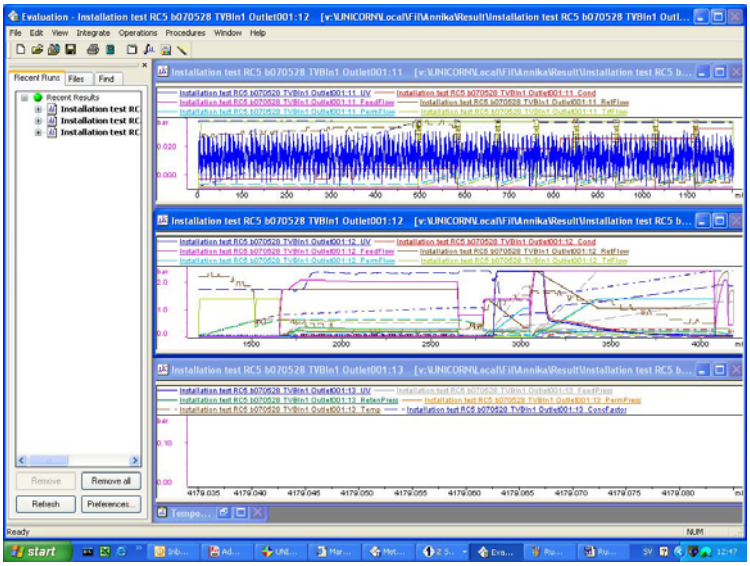


Fig 6-17. Evaluation 2.

In the drop down menu select ***Procedures: Edit: New.***

In the Procedure editor choose ***File: Open from file: Mon_Valve_TestAD.***

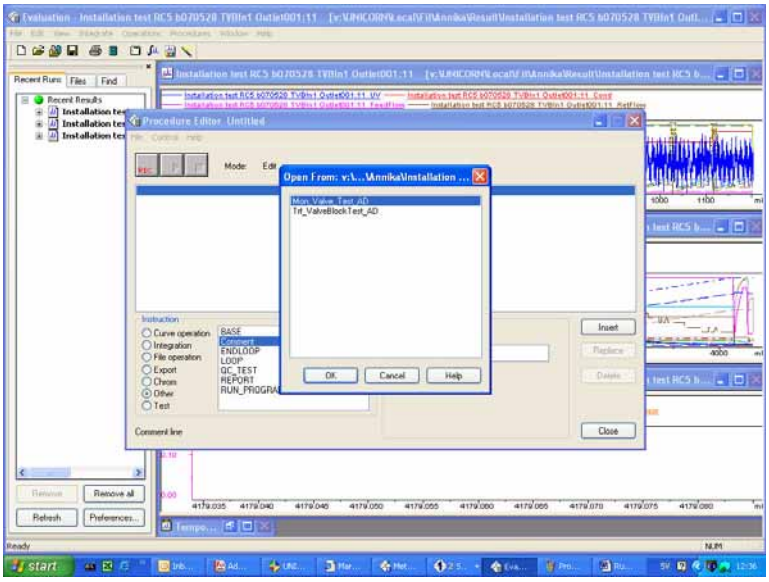


Fig 6-18. Selection of Mon_Valve_TestAD.

Select ***Control: Run*** and the second part of the report will be printed.

7 Troubleshooting the Installation Test

The table below describes some of the faults that may arise when performing the installation test.

Failed Unit	Possible cause	Corrective action
T-VB-in 1 to 8	Mismatch between in and out volumes.	
	Air is drawn in.	Check all fingertights.
	Inlet tubing is not immersed in the water.	Make sure that the inlet tube is immersed in water.
	Reservoir was not empty from the start.	Repeat the test with the reservoir empty from the beginning.
	Obstruction in the flow path.	Check all flow paths and replace if necessary.
	Transfer valve blocked.	Disassemble the connection block and clean it.
	The transfer purge valve is leaking.	Contact your GEHC Service representative for replacement of the valve.
	The level sensor is broken.	Replace the level sensor. Make sure the system is in End mode before starting the system.
R-VB-Out 1 to 3	The retentate valve outlet does not provide enough counter pressure.	
	Old valve block is used.	No action is required since the old valve block will not provide any back pressure.
	Retentate valve incorrectly calibrated.	The retentate valve is incorrectly calibrated. Contact your GEHC Service representative.
Cond sensor	The Cond value did reach its limit	Check calibration/ Check test solution
UV sensor	The UV did not reach its limit.	Check filter settings / Check test solution
	Wrong UV filter installed.	Make sure the 280 mm filter is installed and the position of the lamp housing is correct.

Failed Unit	Possible cause	Corrective action
pH sensor	The pH value did not reach its limit. Sensor not calibrated Sensor broken.	Check calibration/ Check test solution Calibrate the sensor Replace the sensor.
R-PCV / P-PCV	The R-PCV or the P-PCV valve did not provide enough counter pressure.	Contact your GEHC Service representative.
Pressure sensors	The sensor did not detect any pressure Pressure sensor broken R-PCV or P-PCV broken	Check for leakage Contact your GEHC Service representative for replacement of broken parts Contact your GEHC Service representative for replacement of broken parts
Pump flow detection	The pump did not report any flow.	Contact your GEHC Service representative.
Air sensor	Air sensor broken.	Contact your GEHC Service representative.
Permeate outlets	High pressure alarm.	Disassemble and clean the permeate valve outlets. If this does not work, call service.

8 Installation record

Check	Sign	Remarks
1 Unpacking • Contents according to packing lists. • No visible damage.		
2 Installation • Reservoir holder and reservoir installed. • Transfer purge valve (Waste 1) extended to waste reservoir. • Computer and computer display installed. • Ethernet cabling installed. • Frac-920 unpacked and installed. • UniNet-1 cabling installed. • Mains power cabling installed.		
3 Installation test • Solutions prepared. • Tubing to piston seal rinsing system in bottles with 10 mM NaOH in 20% ethanol. • ÄKTAcrossflow prepared. • Installation Test run. • Registration Form completed. • Copy of Registration form stored in System Logbook. • Registration form posted to Service Administration. • Installation Guide stored in User Manual box for future use.		

8 Installation record

9 Registration form

Important!

Warranty registration information

Please ensure that this form is completed and returned to Service Administration to register the users' equipment under warranty.

Name: .....

Institute/company: .....

Address: .....

Department/location: .....

Post Code: .....

Phone Number: ..... **Fax Number:** .....

End Users: ..... **E-mail:** .....

Date of Installation: ..... **Quote No:** .....

Customer Order No: ..... **Invoice No:** .....

Support Agreement purchased with the instrument: Y / N

If YES give details: .....

Installer (name): .....

Signature of Installer:.....

Installation Accepted:.....Date:.....

Note: Fill in serial numbers over-leaf.

9 Registration form

For contact information for your local office, please visit www.gelifesciences.com/contact

GE Healthcare Bio-Sciences AB
Björkgatan 30
751 84 Uppsala
Sweden

www.gelifesciences.com

GE, imagination at work and GE monogram are trademarks of General Electric Company.

Drop Design, UNICORN, ÄKTAcrossflow and ÄKTA are trademarks of GE Healthcare companies.

UNICORN. Any use of this software is subject to GE Healthcare Standard Software End-User License Agreement for Life Sciences Software Products. A copy of this Standard Software End-User License Agreement is available on request.

All third party trademarks are the property of their respective owners.

© 2005-2007 General Electric Company – All rights reserved.
First published February, 2005

All goods and services are sold subject to the terms and conditions of sale of the company within GE Healthcare which supplies them. A copy of these terms and conditions is available on request. Contact your local GE Healthcare representative for the most current information.

GE Healthcare UK Ltd
Amersham Place,
Little Chalfont,
Buckinghamshire, HP7 9NA,
UK

GE Healthcare Bio-Sciences Corp
800 Centennial Avenue,
P.O. Box 1327, Piscataway,
NJ 08855-1327,
USA

GE Healthcare Europe GmbH
Munzinger Strasse 5,
D-79111 Freiburg,
Germany

GE Healthcare Bio-Sciences KK
Sanken Bldg. 3-25-1,
Hyakunincho, Shinjuku-ku,
Tokyo 169-0073,
Japan

imagination at work

11-0012-35 AD 09/2007